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A Proferred Official ICP

By Initial Connection Protocol (ICP), I mean a third level protocol which is initiated by a user process at one site in order to contact a server process at another site. Typically, the user process will be a Telnet and the server process will be a logger, but there may be other cases.

In this RFC, I wish to describe a family of ICP's suitable for establishing one pair of connections (one in each direction) between any user process and any server process, and to propose further a particular subset of this family as the standard ICP for connecting user processes to loggers on systems which accept teletype-like devices.

Notation

We have no standard notation for describing system calls which initiate and close connections or cause data to be sent, so I will use the following *ad hoc* notation.

Init (local = ℓ, foreign = $\int$, size = δ)

causes the local Host to attempt to establish a connection between socket ℓ at the local Host and socket $\int$, with a byte size of δ for the connection.

ℓ is a 32 bit local socket number,
$\int$ is a 40 bit foreign socket number, the high-order eight bits of which specify the foreign Host, and
δ is an eight bit non-zero byte size.
The sum of ℓ and $\int$ must be odd.

Listen (local = ℓ, size = s)

causes the local Host to wait for a request for connection to local socket ℓ with byte size s. The process will be woken when a connection is established. The parameters ℓ and s are the same as for Init.

Send (socket = ℓ, data = d)

The data named by d is sent over the connection attached to local socket ℓ. ℓ must be a send socket attached to a connection. d is the name of a data area.

Receive (socket = ℓ, data = d)

The receive side counterpart to send.

Close (socket = ℓ)

Any connection currently attached to local socket ℓ is closed.

A Family of ICP's

Briefly, a server process at a site attaches a well-advertised send socket L and listens. A user process initiates connection to L from its receive socket U. The byte size for this connection is 32. The server process then transmits a 32-bit even number S and closes the connection. The 32-bit number S and its successor, S+1, are the socket numbers the server will use. The final steps are for sockets S and S+1 at the server site to be connected to sockets U+1 and U respectively at the user site.

Using the notation, the server executes the following sequence:

Listen (socket = L, size = 32)
[Wait until a user connects]
Send (socket = L, data = S)
Close (socket = L)
Init (local = S, foreign = U+1, size = B_u)
Init (local = S+1, foreign = U, size = B_s)

The user executes the following:

Init (local = U, foreign = L, size = 32)
Receive (socket = U, data = S)
Close (socket = U)
Init (local = U+1, foreign = S, size = B_u)
Init (local = U, foreign = S+1, size = B_s)

Note that L is a send socket (odd), while S and U are receive sockets (even). Where L, S or U are used as values of *local*, they are 32-bit numbers; where they are values of *foreign*, they are 40-bit numbers. The parameters B_s and B_u are the byte sizes to be sent by the server and user, respectively.

Examination of the above sequences reveals that an ICP is characterized by the three numbers L, B_s and B_u, and must meet the restrictions that

(a) L is a send socket,
(b) B_s and B_u are legal byte sizes, and
(c) for each L there is only one pair of associated byte sizes.

This last restriction prevents two distinct services from being available through the same socket and distinguished only by the byte sizes.

Telnet ICP

For connecting teletype-like users, i.e. interactive and ASCII, to Hosts serving such users, I propose an ICP of the form described above and characterized by L = 1, $B_s = B_u = 8$. [There has been some confusion about socket numbers. Here I specifically mean L = X'00000001']

Formalities

I propose that the Telnet ICP be made official. Comments should be published before the May NWG meeting, the subject will be discussed there, and we will decide there to accept or reject this protocol.